REMARKS

The Office Action dated August 15, 2003, has been received and reviewed. Claims 1-10 are pending in the present application. Claims 1-10 stand rejected. Applicants respectfully request reconsideration of the application in view of the arguments below.

Additionally, Applicants have provided a corrected abstract removing the spacing problems to comply with MPEP § 608.01(b). Applicants have also provided corrected drawings with this response indicating that FIGs. 2A and 2B are Prior Art. Accordingly, Applicants request that the objections to the abstract and the drawings be withdrawn.

I. Claim Amendments

Claim 1 has been amended to read more clearly. This amendment is unrelated to patentability so that the complete range of equivalents remains available for all claims. Claim 22 has been added. Support for Claim 22 can be found throughout the specification and figures, particularly on page 10, lines 3-6.

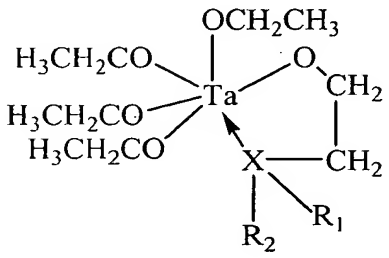
II. Rejections under 35 U.S.C. § 102(b)

Claims 1-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the background of the invention and Figures 2A-2B. Applicants respectfully traverse this rejection for the reasons set forth below.

Case law holds and the M.P.E.P. states that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Furthermore, the identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Additionally, anticipation under 35 U.S.C. § 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention. *Apple Computer Inc. v. Articulate Systems Inc.* 57 USPQ2d 1057, 1061 (Fed. Cir. 2000). The background and Figures 2A-2B fail to disclose the subject matter contained in Claims 1-10.

The Office Action alleges that the background of the invention and Figures 2A-2B show that the claimed semiconductor capacitor includes a tantalum oxide layer positioned between the first and second electrodes and that the final product of tantalum oxide layers formed by either process as disclosed is the same as that claimed in the instant invention. Applicants note that the background states, "A conventional tantalum oxide layer is typically formed by chemical vapor deposition in an oxygen atmosphere using pentaethoxide tantalum (PET), $Ta(OCH_3)_5$, or $TaCl_5$ as a tantalum source. Oxygen (O_2), water (H_2O), hydrogen peroxide (H_2O_2), or nitrous oxide (N_2O) is employed as an oxygen source in such a method." See, page 2, lines 4-9.

Applicants submit that the presently claimed invention claims a different oxide layer, which results in a different end product. Independent Claim 1 recites a semiconductor capacitor comprising both a first and second electrode with a tantalum oxide layer positioned between said first electrode and said second electrode, and that the tantalum oxide layer is formed by depositing at least one precursor and ozone gas, the at least one precursor represented by the formula:



wherein X is selected from the group consisting of nitrogen, sulfur, oxygen, and a carbonyl group; and wherein R_1 and R_2 are independently alkyl. Neither the background nor Figures 2A-2B show a layer comprising a coordination bond form through an unshared electron pair with tantalum. Thus, there is a different valance bond formed based upon the electron donation from the ligands to the metal ions for the tantalum oxide layer of Claim 1 of the present application. Applicants accordingly submit that the tantalum oxide layer produced by the process recited in Claim 1 is not disclosed in the background of the specification.

Furthermore, neither the background nor Figures 2A-2B show a tantalum layer formed by depositing a PET precursor with ozone gas as claimed in Claim 1 of the present

application. Ozone is known in the art as an "unstable" gas, which means soon after it is generated the third atom of oxygen wants to break away form the other two as soon as possible. It does this by oxidation. Thus, the ozone gas plays a role in the tantalum layers deposited in the claims of the present application. The tantalum layers of the background of the invention and Figures 2A-2B are shown for in comparison in "Comparative Example 1", where it is noted that in FIG. 2B, the presence of the tantalum oxide layer formed was non-uniform. Thus, not only is a different layer formed, but the layer formed as discussed in the background, illustrates the need in the art to provide a semiconductor capacitor having a tantalum oxide layer present thereon with a more uniform thickness. Therefore, Applicants submit that independent Claim 1 of the present application, nor dependent claims 2-10 are disclosed by the background of the invention. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections to Claims 1-10.

Additionally, Applicants submit, although not intending to be bound by theory, one possible reason as to why tantalum precursors of the present invention expressed by the formula of Claim 1 display superior coverage to other tantalum precursors, such as for example PET as disclosed in the background, may be described with respect to steric hindrance believed to be attributable to equilibrium vapor pressure and sticking probability impacting the tantalum precursor molecular structure.

Applicants have further amended the claims to add Claim 22 to claim a semiconductor capacitor comprising a uniformly deposited tantalum oxide layer.

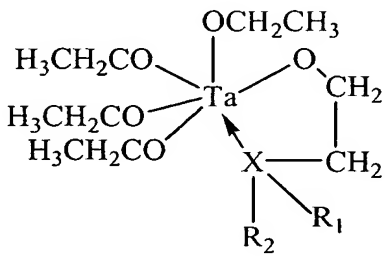
III. Rejections under 35 U.S.C. § 103(a)

Claims 1-10 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Narwankar et al., U.S. Patent 6,037,235, (hereinafter "Narwankar"). Applicants traverse this rejection for the reasons set forth below.

To establish a prima facie case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claim, and there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. M.P.E.P. § 2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior

art also suggests the desirability of the combination. M.P.E.P. § 2143.01, citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990). To support combining references, evidence of a suggestion, teaching, or motivation to combine must be clear and particular, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). The Court of Appeals for the Federal Circuit has also stated that, to support combining or modifying references, there must be particular evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000). Furthermore, as recently affirmed by the Court of Appeals for the Federal Circuit in *In re Sang-su Lee*, a factual question of motivation is material to patentability, **and cannot be resolved on subjective belief and unknown authority**. *See In re Sang-su Lee*, 277 F.3d 1338 (Fed. Cir. 2002). Respectfully, as will be discussed below, the Official Action fails to meet the requirements for a prima facie showing of obviousness under § 103.

The Office Action alleges that Narwankar shows a capacitor including a tantalum oxide layer positioned between a first and second electrode. The Action notes that Narwankar does not disclose the use of ozone as an oxidizer and alleges that it would have been obvious to one of skill in the art to have used O_2 or O_3 as an oxygen source since it is difficult to oxidize and prevent the formation of tantalum oxide. Applicants note that Narwankar never teaches or suggests a semiconductor capacitor comprising a tantalum oxide layer positioned between a first electrode and second electrode, wherein the tantalum oxide layer is formed by depositing at least one precursor and ozone gas, and wherein the precursor is represented by the formula:



wherein X is selected from the group consisting of nitrogen, sulfur, oxygen, and a carbonyl group; and wherein R_1 and R_2 are independently alkyl. Instead Narwankar states that to blanket deposit a tantalum pentaoxide by thermal chemical vapor deposition, a deposition gas mix comprising a source of tantalum, such as TAT-DMAE, and a source of oxygen, such as O_2 or N_2O, can be fed into a deposition chamber while the substrate is heated to a deposition temperature of between 300-500°C. Thus, Narwankar does not teach or suggest the use of ozone gas. Furthermore, as noted in the background of the invention of the present application, the advantages of uses the gases cited by Narwankar negatively impacts coverage of the tantalum oxide layer. In the comparatives examples in tables 1 and 2 it is shown that the tantalum oxide layers were generally are uniform in thickness in their respective upper portions and lower portions for the oxide gas as opposed to the H_20 gas. Thus, Narwankar teaches away from the present invention because its end product would likely result in a different and non-uniform product. There is nothing in Narwankar which would make the present invention obvious. Applicants submit that Narwankar fails to contain any motivation to combine its teachings with the use of ozone gas as required by *In re Sang-su Lee*. Accordingly, Applicants respectfully request reconsideration of Claims 1-10.

Furthermore, Applicants submit that Narwankar fails to teach or disclose a tantalum layer where each of R1 and R2 may be an alkyl great than methyl and that X may be selected from the group consisting of oxygen, sulfur or a carbonyl as recited in Claim 1 of the present application. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejections to Claims 1-10.

Applicants further submit that Claim 10 is further allowable as it recites a temperature range outside the range of Narwankar.

CONCLUSION

In view of the remarks presented herein, Applicants respectfully submit that the claims define patentable subject matter. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (919) 854-1400.

It is not believed that an extension of time and/or additional fee(s)-including fees for net addition of claims-are required, beyond those that may otherwise be provided for in documents accompanying this paper. In the event, however, that an extension of time is necessary to allow consideration of this paper, such an extension is hereby petitioned under 37 C.F.R. §1.136(a). Any additional fees believed to be due in connection with this paper may be charged to our Deposit Account No. 50-0220.

Respectfully Submitted,

Jarett K. Abramson
Registration No. 47,376

USPTO Customer No.: 20792
Myers Bigel Sibley & Sajovec, P.A.
Post Office Box 37428
Raleigh, NC 27627
Telephone (919) 854-1400
Facsimile (919) 854-1401

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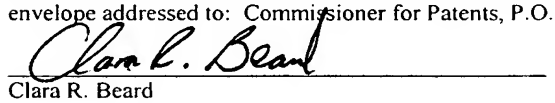

Clara R. Beard